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make is that employers should treat their workmen well, and give freely in charity. It would have been far better to take the ground that the distribution of wealth is not a religious question, and that religious teachers, as such, have nothing to do with it. On the subjects of marriage and family life, and on the duties of parents to their children, the author has many good remarks; and here, as well as in the chapters on wealth, he shows himself unalterably opposed to the communistic doctrines now so widely prevalent. The chapter on 'Christianity and the Problems of Education' contains an earnest and in some respects able plea for moral and religious teaching in both public and private schools.

Dr. Hill's book seems to us the work of an earnest Christian man, deeply interested in the social problems of the time, but unfortunately lacking in the analytical and critical power which the thorough treatment of those problems requires.

NOTES AND NEWS.

THE long-neglected graphic study of the Mexican tribes has within the last twenty years received a new impulse by several native and foreign scientists who published their results through their own publishers. The governments of the single States are also becoming aware of the fact that something should be done for researches on the tribes within their borders. Thus, General Mariano Jimenez, governor of Michoacan, is providing now for the publication, at public expense, of the *Anales del Museo Michoacano* at Morelia, the capital, having previously shown his love for science by founding the new Museo Michoacano, and providing for its maintenance. The editorship of the *Anales* is in the hands of the director of the museum, Dr. Nicolas Leon, well known already through his republication of ancient books on Indians and their languages. The first three numbers (all published in 1888) which have come to hand contain thirty-two pages each, and the following treatises: 'Arithmetic among the Tarascos (Tarascan Numerals);' 'Etymology of Tarascan Geographical Names;' 'The Tarascan Grammar of Father Lagunas (in the Original Text);' 'On the National Name "Tarasco";' 'The Tarascan Calendar (after a Manuscript in the Congressional Library, Washington);' 'Codex Plancarte, on Tarascan Antiquities of the Fifteenth and Sixteenth Centuries.' The *Anales* may be ordered through George A. Leavitt & Co., 787-789 Broadway, New York City.

— A book of a singular value for ethnography is Lieut. H. T. Allen's 'Report of an Expedition to the Copper, Tananá, and Kóyukuk Rivers in Alaska, 1885,' an octavo government publication of one hundred and seventy-two pages, and many maps and illustrations from photographs. The exploring force consisted of three men, and had to proceed up the Copper River, and descend the Tanana River valley. Its explorations covered a space of approximately two hundred and forty thousand square miles and seventeen degrees of latitude, the area of which was almost entirely unknown up to the present time. The narrative of the exploring party is of picturesque and varied interest, and in every way is highly instructive for future travellers through these lonesome tracts. The observations made on the characters of the savages show that the former often partake of the burlesque. Among the tribes met with, we mention the Midnooskies, Mahlemuts, Atnatánas, Tananátnas, Ingalks or Kaiyu-Khotánas, Unakho-tána, Mnakhó-tána, Nabesna-tána, etc. The tribes ending in -tána ('men') are all of the Tinné stock, while those in -miut are Innuit or Eskimo. The appendix contains zoölogical, geological, mineralogical, and meteorological observations of value.

— *Nature* attributes to the Vienna correspondent of the *Times* the announcement, that, in pursuance of a resolution passed at a recent meeting, the Vienna geologists will invite the International Geologists' Congress, which will assemble in London in September, to hold its next meeting in Vienna.

— At a recent meeting of the Victoria Royal Society, according to *Nature*, the president (Professor Kerrot) announced that the first meeting of the Australian Association for the Advancement of Science would be held at Sydney, beginning Sept. 4, the second at Melbourne, the third at Adelaide. The proposal that Victoria

should join in the movement was favorably received, but at that meeting no action was taken in the matter.

— The Statistical Abstract for 1887, just issued, gives the following interesting figures in regard to the schools of the United States. In 1871-72 there were in this country 12,828,847 children of school-age, of whom 7,479,656 were enrolled in the public schools. These pupils were taught by 81,509 male, and 124,180 female teachers, to whom aggregate salaries of \$37,503,309 were paid. The total expenditure for the schools that year was \$70,891,374. In 1884-85 the school population had increased to 17,764,658, and the number of pupils enrolled in the public schools to 11,464,661. The number of male teachers was 109,632, and of female 199,422, to whom salaries amounting to \$73,932,668 were paid. The total expenditures upon the schools for the latter year were \$111,521,542.

— A very successful meeting of the Massachusetts Assembly of the Agassiz Association was held at Boston, May 29, 30, and 31. The sessions were held in the lecture-room of the Boston Society of Natural History, by the courteous invitation of that organization; and there, after a preliminary meeting of the delegates at the Parker House, the convention assembled at 8 o'clock Tuesday evening for a business meeting. The business consisted almost entirely in the election of officers, and, with scarcely an exception, the old board were re-elected. At 9 o'clock Wednesday morning President Farrar, of the assembly, opened the exercises by an address of welcome, to which the president of the Agassiz Association responded. Reports of work were next given by delegates from the twenty-one chapters represented, and from the Boston Assembly. These reports were of the most interesting character, and showed not only the deepest earnestness on the part of the chapters, but also gave evidence of much faithful work already accomplished by them. The convention was next addressed by Prof. Edward S. Morse, director of the Peabody Academy of Science at Salem, Mass. Professor Morse stated forcibly the advantages of a thorough scientific training, and cordially commended the association for the good work it has accomplished, pointing out various lines in which it may hereafter work to increased advantage. Prof. Alpheus Hyatt, curator of the Boston Society of Natural History, followed in a most helpful address, in which, after heartily seconding Professor Morse's suggestions, he emphasized still more strongly the possibilities of usefulness that are in the association, and showed the great desirability of securing as soon as possible such an endowment as may place the work of the Agassiz Association upon a permanent basis. He then gave a clear account of the Agassiz Museum, which the delegates were soon to visit, explaining the principles which rule in the arrangement of its contents, and illustrating by diagrams and carefully selected specimens, the distribution of the collections in the different rooms. Dr. Lincoln closed the morning by an exceedingly instructive and interesting address on the minerals of Boston and vicinity. In the afternoon and evening, parties of delegates, under the guidance of committees from the Boston chapters, visited various places of interest. About one hundred were present during the convention, many pleasant acquaintances were formed, and all felt that a long step had been taken toward advancing the assembly toward that position of stability to which it aspires. Perfect harmony prevailed, and the delegates separated with the firm determination to work for the association more diligently than ever; and this determination was expressed not carelessly, but with actual enthusiasm. In addition to those mentioned above, Prof. W. O. Crosby gave a most suggestive and helpful address.

— The fifth annual convention of the Association of Official Agricultural Chemists will be held at the United States Department of Agriculture on Thursday, Friday, and Saturday, Aug. 9, 10, and 11. All who are interested in the analysis of fertilizers, cattle-foods, dairy products, alcoholic beverages, and sugar are invited to attend.

— The State Board of Health of Michigan has just published its fourteenth annual report, for the fiscal year ending September, 1886. It contains very many valuable papers, to most of which we have already referred in *Science*. Among the most important are

the following: 'Tyrotoxicon, its Presence in Poisonous Ice-Cream,' by Victor C. Vaughan, M.D., Ph.D.; 'Analysis of Five Hundred Deaths occurring in the Michigan Mutual Life Insurance Company,' by Henry F. Lyster, M.D.; 'Causation of Pneumonia,' by Henry B. Baker, M.D., with illustrations, diagrams, etc.; and 'Communicable Diseases in Michigan during the Year ending Dec. 31, 1886.'

—The cod and whale fisheries in the north of Norway, according to *Nature*, have entirely failed this spring, and it is suggested that the non-appearance of the former is due to the low temperature of the sea this season. Thus the Russian naval officers stationed on the Murman coast found in May only a surface temperature of from 1° to 2° C., and along the Norwegian coast it has been lower still. As to the whale-fishing, only 40 animals had been captured by the end of April, against 200 last year. It is maintained that the present wholesale slaughter carried out by Norwegian and Russian steamers equipped with harpoon guns will eventually extirpate these animals, and some measure for their preservation is contemplated. Advices from the Arctic regions state that there was an enormous mass of drift-ice in those waters during this spring. Two sealers, the 'Hekla' and the famous 'Vega,' were imprisoned for more than a month in the ice to the north-east of Norway.

— We learn from *Nature* that the annual meeting for the election of fellows of the Royal Society was held at the society's rooms in Burlington House on June 7, when the following gentlemen were elected: Thomas Andrews, F.R.S.E.; James Thomson Bottomley, M.A.; Charles Vernon Boys; Arthur Herbert Church, M.A.; Prof. Alfred George Greenhill, M.A.; Lieut.-Gen. Sir William F. D. Jervois, R.E.; Prof. Charles Lapworth, LL.D.; Prof. T. Jeffery Parker; Prof. John Henry Poynting, M.A.; Prof. William Ramsay, Ph.D.; Thomas Pridgin Teale, F.R.C.S.; William Topley, F.G.S.; Henry Trimen, M.B.; Prof. Henry Marshall Ward, M.A.; William Henry White, M.I.C.E.

— The laying of the corner-stone of the new building of the Pennsylvania Agricultural Experiment Station took place Wednesday, June 27, at State College, Penn.

— The New York Mineralogical Club has arranged for excursions on the Saturday afternoons of the present season. It is intended that these outings shall acquaint the members personally with the most interesting localities of the neighborhood; enable them to secure specimens suitable for the permanent cabinet of the club, as well as for private possession; and enlarge the influence of the club by associating with its regular members, in these informal trips, any persons of suitable standing (ladies or gentlemen) who may feel an interest therein.

— The thirty-seventh meeting of the American Association for the Advancement of Science will be held at Cleveland, Aug. 15-21. The date of Aug. 22 was determined upon; but owing to the national gathering of the Knights Templars in Cleveland during that week, and at the earnest solicitations of the local committee, the council have changed the date to Aug. 15. A large local committee has been organized, the several sub-committees of which are working earnestly, and, so far as depends upon the committee, a successful meeting is assured. A special office and reception-rooms for the association have been opened at No. 407 Superior Street, next door to the Hollenden, where will be the hotel headquarters. The meetings will be held in the Central High School building on Wilson Avenue, where also will be the offices of the local committee and of the permanent secretary during the week of the meeting. A special circular in relation to railroads, hotels, and other matters, will be issued by the local committee. The members of Section E will hold an informal meeting at the Central High School building on Tuesday, Aug. 14, at 3 o'clock, to consider plans for holding sessions between the annual meetings of the association. The Entomological Club will meet at 9 A.M., on Wednesday, Aug. 15, at the Central High School building. The Botanical Club will hold a meeting, as usual, on the day preceding the meeting of the association, in the Central High School building. The Society for the Promotion of Agricultural Science will hold its ninth annual meeting in Cleveland, beginning on Monday evening, Aug. 13, at the Central High School building, and continuing on Tuesday.

— During the summer of 1887, the manager of the physical and chemical department of James W. Queen & Co., Mr. Joseph J. Walton, made a three-months' tour in Europe for the purpose of perfecting arrangements for the sale of new forms of apparatus in this country, and also to look up any thing new and interesting which would be of value to those interested in these and other branches of science. One of the first places visited was the laboratory of Sir William Thomson, at the University in Glasgow. Mr. Walton also had the pleasure of examining the newly equipped laboratory of Professor Ayrton at the City and London Guilds Institute, and the Cambridge Scientific Instrument Company stock of physiological apparatus. Another valuable result of the stay in England was the arrangement which has been made for the furnishing of practical and cheap apparatus for the use of students in the study of physics by the new method, — that of allowing the student to experiment for himself. A visit was paid to the works of Siemens Brothers & Co. In Paris special attention was paid to the physiological apparatus of Verdin. Special attention was paid, both in Paris and Berlin, to the subject of apparatus for the study of bacteriology. At the well-known house of Duboscq, in Paris, a number of new optical instruments were examined and purchased. Quite a visit was paid to the ateliers of the Société Genevoise pour la Construction d'Instruments de Physique at Geneva. The optical establishments in Munich were among the places visited. Steinheil, Merz, and others have long been known as the best makers of prisms, lenses, etc., in Europe. Some new forms of balances were found by Mr. Walton. One has a very ingenious new arrangement for varying the sensibility. We may add there are other instruments of which we have not spoken, for which the firm soon hope to have price-lists ready and to put on the market. Some of these may prove of even greater value than many of those mentioned.

— *Engineering* gives an account of a new material bearing the name of 'woodite,' which is being introduced as a protection to ships of war, and for many other purposes. Woodite is a substance bearing a strong resemblance to native india-rubber, but, unlike that material, it never grows sticky, and resists the action of oils and heat. If it be placed on the outside of a vessel, a shot may be driven through it, and yet it will close up so completely that it is difficult to find the speck which marks the spot where the shot entered. Woodite is coming into use for many commercial purposes, such as delivery-valves, air-pump valves, packing, wheel-tires, and it is said to be far more efficient for these purposes than either leather or india-rubber.

— The French General Translantic Company has furnished its large fleet with complete apparatus for dropping oil on the waves during bad weather. The company states that it has adopted the use of oil after repeated trials.

— Ginn & Co. will publish in July 'A College Algebra' prepared by Professor Wentworth. — William S. Gottsberger publishes a volume of five tales of ancient Greece entitled 'Pictures from Hellas,' by Peder Mariager, translated from the Danish by Mary J. Safford. — D. C. Heath & Co. will publish at once Volume II. of Dr. Bernhardt's 'Novellen Bibliothek.' — The Worthington Company will publish at once a book entitled 'William Shakspeare portrayed by Himself: a Revelation of the Poet in the Career and Character of One of his Dramatic Heroes,' by Robert Waters. — Waterman & Amee, Cambridge, Mass., have in press a volume of 'Selections illustrating Economic History since the Seven-Years' War,' by Benjamin Rand. — Prof. Richard T. Ely's treatise on 'Taxation in American States and Cities,' recently published by T. Y. Crowell & Co., is to be used as a textbook in the Buffalo Law School and at Vanderbilt University. — The Historical Publishing Company, 61 Broadway, New York, will publish at once a volume entitled 'Camp-Fire Stories,' by W. F. Cody ('Buffalo Bill'). It is not altogether about his own frontier experiences that Mr. Cody has written, but of those of Daniel Boone, Kit Carson, and other pathfinders. The manuscript, which makes seven hundred printed pages, was dictated to a stenographer during 'Buffalo Bill's' English trip. — 'Methods and Aids in teaching Geography,' is the title of a new educational work by Charles F. King, A.M., head master of the Dearborn School in

Boston, to be published by Messrs. Lee & Shepard. The same firm has now in press a new volume of travels entitled 'Mexico, Picturesque, Political, Progressive,' the joint work of Mrs. Mary Elizabeth Blake of Boston, and Mrs. Margaret F. Sullivan of Chicago. — Dr. Allan McLane Hamilton will contribute a paper in the July issue of *The American Magazine* on 'Spiritualism and Like Delusions,' in which he will show that spiritualism is at best a form of mild insanity. — The *Popular Science Monthly* for July contains the following articles: 'Safety in House-Drainage,' by William E. Hoyt; 'Gourds and Bottles,' by Grant Allen; 'Darwinism and the Christian Faith;' 'The Teaching of Psychology,' by M. Paul Janet; 'Customs and Arts of the Kwakiool,' by George M. Dawson; 'Lines of Progress in Agriculture,' by Dr. Manly Miles; 'Fallacies in the Trades-Unions Argument,' by J. B. Mann; 'Botany as it may be Taught,' by Prof. Byron D. Halsted; 'Arctic Alaska,' by W. L. Howard; 'Manual or Industrial Training,' by Prof. G. Von Taube; and a sketch of Paul Bert. — *Time*, under which title *Tid-Bits* will hereafter be known, as being more nearly answerable to the present character of the paper, will be conducted on the same lines which have won *Tid-Bits* its success; the changes made with the present issue being external only, and not affecting the methods of the paper, which remains under the same proprietorship and editorial management.

— The *Engineering and Mining Journal* is authority for the statement that the 'record' in rapid machine-work has again been lowered. Heretofore the Baldwin Locomotive Works of Philadelphia have held the first place with the record of an engine built in twenty-four hours, but the Pennsylvania Railroad Company has now taken the palm by constructing a full-sized (110,000 pounds) anthracite-burning locomotive at the Altoona shops in sixteen hours fifty-five minutes. The work was commenced on the morning of the 18th of June, and in five minutes less than seventeen hours the engine was turned out ready for use. It is to run on the New York division of the Pennsylvania Railroad. This feat is, we believe, quite unrivaled in locomotive-building.

— Prof. Simon Newcomb, superintendent of the Nautical Almanac Office, is seriously ill of spinal irritability, and, on the recommendation of a board of medical officers, has gone to the Chelsea Hospital for special treatment.

— Dr. W. J. Hoffman of the Bureau of Ethnology has gone to northern Minnesota to obtain some important historical information which has been promised him by influential Indian chiefs who live near the Canada line.

— Mr. Arthur P. Davis of the Geological Survey Office, and Miss Lizzie Brown of the Nautical Almanac Office, were married on the evening of the 21st inst. Mr. Davis is a nephew of Major J. W. Powell, director of the Geological Survey, and Miss Brown is one of the most accomplished mathematicians in the country. Each had been a member of the Corcoran Scientific School of the Columbian University, and each had just received its degree of Bachelor of Science.

— The Signal Office has been making experiments in the court-yard of the War Department building with a new machine for testing anemometers. The device consists of several arms, each twenty-eight feet long, on the ends of which are placed anemometer-cups such as are used in the Signal Service. The arms being revolved at a given rate of speed, the rate recorded by the anemometer-cups is compared with the known rate, and any differences noted. Professor Hazen, who has had charge of the experiments, says that they have been satisfactory, although absolutely still air has not been obtained in the War Department court-yard. Even when there was a dead calm outside, a very perceptible movement of the air inside the court-yard was observed. This phenomenon, which occurred early in the morning, was attributed to the fact that the court-yard had become greatly heated the day before, and the warm air was then rising and being forced out by the cooler, denser atmosphere from the outside, that came into the court-yard through the two carriage-ways. Similar experiments to discover the exact relation between the movement of the wind and the whirling of the cups were made about 1850, but in the machine

used then the arm was only four feet long, instead of twenty-eight as in the new one. When the short arms were whirled with great velocity, they caused a very perceptible movement of the air.

— The magnificent water-front of Staten Island is so important a part of New York harbor, and access to it from the mainland is so easy, that more or less definite projects for reaching it by railroad have been often brought forward. The Arthur Kill Bridge, which is now practically completed, will, if it is allowed to stand, enable the lines now entering Jersey City to reach directly the deep-water on the Staten Island front, and will greatly increase the available capacity of the harbor for handling freight.

— In *Bradstreet's* of June 23 is given the message of Dr. Miguel Juarez Colman to the National Congress of the Argentine Republic. In this message are presented important facts in regard to the progress of this South American Republic. Argentine Republic has an area of 1,125,086 square miles, with a population in 1887 of 3,935,286. It has made wonderful progress in the building of railways. Of the 17 railways conceded, 13 have the guaranty of the government. The guaranteed lines report a length of 7,961 kilometres, and the unguaranteed 1,272, making 9,233 kilometres. The contracts for the following guaranteed lines are already prepared: Tartagal Reconquista to Formosa, Bahia Blanca to Ville Mercedes, San Juan to Salta, Chumbreha to Tinogosta and Andalugata, Goya to Monte Caseros, Resistencia to Metan, and San Custobal to Tucuman. The aggregate length of railways in operation is 6,306 kilometres, equal to 3,918 $\frac{4}{10}$ miles. These roads have carried within a year 7,657,406 passengers and 3,705,876 tons of freight. The gross revenue from the yearly traffic is \$23,805,722.15, against expenses of \$13,177,172.15, giving a net annual revenue of \$10,627,950.14. The debt of the Republic March 31, 1888, was: internal, \$47,100,000; and external, \$92,427,000. The latter is expected to be paid off within eight years. Argentine 5-per-cents issued in 1887 at 85 $\frac{1}{2}$ were on March 31 quoted at 97, and the 6-per-cents at 102@ 104 $\frac{1}{2}$. In 1886 the import and export trade aggregated \$194,000,000. In 1887 it had increased \$24,000,000, of which \$9,500,000 were imports, and \$14,500,000 exports. The gain is due to the increased production of cereals, hides, and frozen meats. The suppression of export duties has also contributed to the increase in the volume of exports. Import and export values in the first quarter of 1888 show an increase, when compared with the first quarter in 1887, of \$4,000,000. In 1884 the total revenue was \$46,762,000. The revenue for 1887 was early estimated at \$50,522,000, but it produced \$58,135,000, or \$13,372,000 in excess of the revenue of 1886. The budget of expenses in 1887 was \$43,263,000, and \$6,756,000 for special laws without special resources, leaving a remainder of \$8,116,000. In the fourteen provinces of the Republic are 2,080 schools, with 142,471 pupils. There are 116 schools in the capital of the Republic, including 24 graduated, 56 elementary, 20 for infants, and 16 for adults. In the 116 schools are 746 teachers, including 224 male and 522 female. In the national territories there are at the present time 42 schools, with 64 teachers and 2,998 scholars. The total immigration in 1887 was 137,000, and for the first quarter of 1888, 40,500. The expected immigration in all of 1888 is about 200,000. The cost of passage from Europe for 50,000 agriculturists and artisans will be advanced to enable them to come to Argentine Republic in 1888. The commissary of immigration has gone to Europe to establish the requisite appliances to promote immigration. Immigration, colonization, and railways are rapidly transforming the country, and as a consequence its productive forces are being multiplied, and the comforts of life there are increased. The field of labor is enlarged, the educational work is taking rapid strides, and internal improvements are receiving attention from the government.

— The courses in physics which were proposed for this summer at Harvard College have been given up because of the small number of applications for them received up to June 1, which was the date mentioned in the physics circular. On Saturday, July 7, and on Saturday, July 14, an exposition of the apparatus and methods which would have been used in the elementary summer course will be given at the Jefferson Physical Laboratory, Cambridge, the hours each day being from 10 to 1 and from 3 to 5. This exposi-

tion will be for the benefit particularly of those who propose to teach the elementary physics of the requirements for admission to Harvard College. Admission will be free.

— We learn from *Nature* that the conferences convened by the London Chamber of Commerce to consider the question of commercial education led to the appointment of a committee for the full discussion of the subject. This committee nominated a sub-committee, among the members of which were Sir John Lubbock, Sir Henry Roscoe, and Sir B. Samuelson. A scheme for the improvement of commercial education has now been drawn up by the sub-committee, and sent to various business-men, schoolmasters, and other authorities on education, with a request for practical suggestions. The scheme, as it stands, proposes as obligatory subjects for examination for a commercial certificate, (1) English; (2) Latin; (3a) French; (3b) German, Spanish, or Italian; (4) history of British Isles and colonies, general and modern history, including commercial history; (5) geography, physical, political, commercial, and industrial; (6) mathematics; (7) drawing. Proficiency is also required in at least one of the following: physics, chemistry, natural history, commerce, and political economy.

LETTERS TO THE EDITOR.

** Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.

Twenty copies of the number containing his communication will be furnished free to any correspondent on request.

The editor will be glad to publish any queries consonant with the character of the journal.

The Ancient Works of Ohio.

As investigation and explorations proceed, one ray of light after another pierces the mystery which has so long hovered about the ancient works of Ohio, enabling us thereby to catch glimpses of the prehistoric times of that great State. As was stated in a former communication, the evidence obtained through the explorations of the Bureau of Ethnology bearing upon the origin of the typical works of that State leave but little if any doubt that they were built by the ancestors of the Cherokees; but this must be understood as applying only to the circles and squares, and other works of this type, together with the mounds pertaining thereto, or bearing indications of having been built by the authors of the enclosures. The links of this chain have been gathered from the Ohio antiquities, the mounds and works of West Virginia, East Tennessee, and western North Carolina; in fact, the chain is not single, but multiple, for there are several distinct lines of evidence leading to the same conclusion. Some items bearing on this question have been published in *Science* and elsewhere, but since those appeared additional testimony has been obtained by the bureau.

But Ohio was the home of more than one mound-building tribe: there are good reasons for believing that we find here the work of six or seven different peoples or tribes: —

First, The typical works by the Cherokees, before mentioned.

Second, The walls, enclosures, and other defensive works of Cuyahoga County and other northern sections of the State. The key which will help to solve the riddle of the monuments of this type is to be found in central and western New York, the former home of the Iroquois nations: in other words, they are attributable to some branch of the Iroquois or Huron-Iroquois stock. It is possible, and even probable, that the works of Cuyahoga County are attributable to the Eries; but this, if admitted, is only another proof that this tribe pertained to the Iroquois group. The same type of works is also found in eastern Michigan as far north as Ogemaw County.

Third and *Fourth*, The box-shaped stone graves. There is no longer any good reason for doubting that the burial-cists of this type, found in Ohio, are attributable to two tribes, — the Delawares and Shawnees; those of the central portion of the State, especially of Ashland County, marking the burial-places of Delaware Indians, and those found along the Ohio River the burial-places of Shawnees. There are, however, no marks or peculiarities by which the works of the two tribes in this State can be distinguished from each other. As but few graves of this type are found in mounds

in Ohio, it is more than probable that they belong to the time of the later occupancy of this region by these tribes. Nevertheless there are some reasons for believing that some of the works in Hamilton County pertain to an earlier occupancy of that section by the Shawnees; but this point cannot be satisfactorily settled until further explorations have been made in adjoining portions of Kentucky.

Fifth, Certain stone mounds, and mounds containing stone vaults or graves of a peculiar type, which it would be difficult to explain without the use of figures, which cannot be introduced here. Sepulchres of this type have been found at various points in the northern half of Kentucky, from the extreme north-east corner of the State as far west as Union County; but in Ohio they have as yet been discovered only in a few of the extreme southern counties. This type of works is peculiar, and presents a problem to which we have thus far been unable to find any clew. It is probable that the builders belonged to a tribe which has become extinct. Unless certain works in north-east Missouri, which bear some resemblance to those of the type mentioned, are attributable to the same people, no traces of them are to be found elsewhere than in the sections mentioned. Is it possible that the appellation 'Bloody Ground' is an echo which has floated down the ages from prehistoric times? These sepulchres indicate a savage life and fierce warfare with beasts of prey.

Sixth, The effigy mounds, of which some two or three only are known within the limits of Ohio. These also present a problem difficult to solve. It is possible that some sudden freak of the medicine-men or medas of some one of the tribes mentioned may have brought about the building of these strange works, but such a supposition is far-fetched and without any basis. It is more likely that a straggling clan or small tribe of the Wisconsin mound-builders, — probably belonging to the Dakotan stock, — wandering toward the south-east, left these mementos of their passage. The bird-effigies of Georgia may possibly have been built by the same people. Such breaking-away of a clan or tribe and its wandering to a distant locality is not without parallel in Indian history.

Seventh, Fortifications of that type of which Fort Ancient is an example. Although I have introduced this type under a separate number, I am inclined to attribute the principal works of the class to the builders of the typical works of the State, — the Cherokees. This is also the opinion of most of our archaeologists, yet the relation between the works in some cases is not apparent. Fort Ancient is an example of this kind. Moreover, there are some indications in this instance of the influence of the white man, especially in the northern section of the work.

Omitting the last from the list, there remains clear and satisfactory evidence that the ancient works of the State are due to at least six different tribes.

CYRUS THOMAS.

Youngsville, Penn., June 25.

Distillation of Mercury at Ordinary Temperatures.

In the physical laboratory of the United States Geological Survey a normal barometer hangs in a window-jamb about 35 centimetres from the glass of the window. As the window faces east, it has the sun until noon. The barometer-tube at and above the upper surface is 25 millimetres in diameter, and extends 6 centimetres above the mean position of that meniscus. It was observed that during the summer small globules of mercury covered the inner wall of the tube above the column, on the side farthest from the window. In the winter they collected upon the side nearest to the window. An inspection showed that the radiation from the tube was greatest toward the cool room in the summer, and toward the window and out of doors in the winter, thus keeping the side of greatest radiation slightly cooler than the mass of the reservoir, and condensing upon it some of the vapor of mercury of the Toricelli vacuum. In this way several grams were condensed and fell back in a single month, — a fact which seemed quite interesting when it is remembered that the vapor-tension of mercury at even 30° C. (86° F.) is only .06 of a millimetre. Of course, by bending the top of the tube over and downward toward the cooler side, the distillate could be collected and measured.

W. HALLOCK.

Washington, D.C., June 21.